

IN THE CLAIMS:

Please cancel Claims 2, 8, 14, 23, 29 and 35 without prejudice to or disclaimer of the subject matter recited therein.

Please amend Claims 1, 4 to 7, 10 to 13, 16 to 20, 24 to 26, 32 and 38, as follows.

Note that all the claims currently pending in this application, including those not presently being amended, have been reproduced below for the Examiner's convenience.

1. (Currently Amended) A process cartridge detachably mountable to a main body of an electrophotographic image forming apparatus for forming an image on a recording medium, the main body having a twisted hole whose cross-section has a plurality of corners, said process cartridge comprising:

an electrophotographic photosensitive drum having a drum cylinder;

a developing roller for developing an electrostatic latent image formed on said electrophotographic photosensitive drum; and

a driving-force transmitting part provided on one lengthwise end of said electrophotographic photosensitive drum, said driving-force transmitting part having:

a coupling portion fitted and fixed to one end of said drum cylinder of said photosensitive drum,

a twisted protrusion to be fitted in the twisted hole, wherein a cross-section of said twisted protrusion has a plurality of corners,

a shaft supported by a bearing portion,

a gear portion for transmitting a driving force to said developing roller, said shaft and said gear portion overlapping each other in an axial direction of said electrophotographic photosensitive drum, and

a second gear portion provided in juxtaposed relationship with said gear portion and disposed between said gear portion and said coupling portion in the axial

direction, and wherein said second gear portion transmits a driving force to a transfer roller provided in the main body of the apparatus,

wherein when the twisted hole is rotated with said protrusion fitted in the twisted hole when said process cartridge is mounted to the main body of the apparatus, a rotational force of the twisted hole is transmitted to said electrophotographic photosensitive drum through said protrusion, and

wherein said coupling portion, said second gear portion, said gear portion, said shaft, and said twisted protrusion provided on an end surface of said shaft are formed integrally.

2. (Cancelled)

3. (Cancelled)

4. (Currently Amended) A process cartridge according to Claim 2; 1,

wherein a through-hole is formed through said coupling portion, said gear portion, said shaft portion overlapping said gear portion, and said protrusion,

wherein a grounding pin is provided in the through-hole,

wherein said grounding pin is provided on the inner end surface of said driving-force transmitting part, and is in contact with a grounding plate which is in contact with the inner surface of said drum cylinder, whereby when said process cartridge is mounted to the main body of the apparatus, said grounding pin comes into contact with a main body grounding contact provided in the twisted hole, and said electrophotographic photosensitive drum is electrically grounded to the main body of the apparatus.

5. (Currently Amended) A process cartridge according to Claim 1 or 2, 1, 2, or 4,

wherein a portion of said shaft is surrounded by said gear portion.

4. (Currently Amended) A process cartridge according to Claim 1 or ~~2, or 4,~~ wherein the cross-section of the twisted hole is a substantially equilateral triangle, and the cross-section of said protrusion is a substantially equilateral triangle.

5. (Currently Amended) An electrophotographic photosensitive drum used in an electrophotographic image forming apparatus for forming an image on a recording medium, the electrophotographic image forming apparatus having a twisted hole the cross-section of which has a plurality of corners, said electrophotographic photosensitive drum comprising:

a drum cylinder having a photosensitive layer on a peripheral surface thereof; and
a driving-force transmitting part mounted on one end of said drum cylinder, and
having:

a coupling portion fitted and fixed to one end of said drum cylinder of said electrophotographic photosensitive drum,

a twisted protrusion to be fitted in the twisted hole, wherein a cross-section of said twisted protrusion has a plurality of corners,

a shaft supported by a bearing portion,

a gear portion for transmitting a driving force to a developing roller, said shaft and said gear portion overlapping each other in an axial direction of said electrophotographic photosensitive drum, and

a second gear portion provided in juxtaposed relationship with said gear portion and disposed between said gear portion and said coupling portion in the axial direction, and wherein said second gear portion transmits a driving force to a transfer roller provided in the main body of the apparatus,

wherein when the twisted hole is rotated with said protrusion fitted in the twisted hole when said photosensitive drum is mounted to the main body of the apparatus, a

driving force for rotating said electrophotographic photosensitive drum is received from the main body of the apparatus, and

wherein said coupling portion, said second gear portion, said gear portion, said shaft, and said twisted protrusion provided on an end surface of said shaft are formed integrally.

8. (Cancelled)

9. (Canceled)

10. (Currently Amended) An electrophotographic photosensitive drum according to Claim 8, wherein a through-hole is formed through said coupling portion, said gear portion, said shaft portion overlapping said gear portion, and said protrusion,

wherein a grounding pin is provided in the through-hole, and

wherein said grounding pin is provided on the inner end surface of said driving-force transmitting part, and is in contact with a grounding plate which is in contact with the inner surface of said drum cylinder, whereby when said electrophotographic photosensitive drum is mounted to the main body of the apparatus, said grounding pin comes into contact with a main body grounding contact provided in said twisted hole, and said electrophotographic photosensitive drum is electrically grounded to the main body of the apparatus.

11. (Currently Amended) An electrophotographic photosensitive drum according to Claim 7, or 10, 7, 8, or 10, wherein a portion of said shaft is surrounded by said gear portion.

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12 (Currently Amended) An electrophotographic photosensitive drum according to Claim 7 or 10 7, 8, or 10, wherein the cross-section of the twisted hole is a substantially equilateral triangle, and the cross-section of said protrusion is a substantially equilateral triangle.

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13. (Currently Amended) A driving-force transmitting part mounted on one end of an electrophotographic photosensitive drum used in a process cartridge detachably mountable to a main body of an electrophotographic image forming apparatus for forming an image on a recording medium, the electrophotographic photosensitive drum having a drum cylinder, the electrophotographic image forming apparatus having a twisted hole whose cross-section has a plurality of corners, said driving-force transmitting part comprising:

a coupling portion fitted and fixed to one end of the drum cylinder of the electrophotographic photosensitive drum,

a twisted protrusion to be fitted into the twisted hole when the process cartridge is mounted to the main body of the apparatus, wherein a cross-section of said twisted protrusion had a plurality of corners;

a shaft supported by a bearing portion when said driving-force transmitting part is mounted in the process cartridge;

a gear portion for transmitting a driving force to a developing roller, wherein said shaft comprises a shaft portion at which said shaft and said gear portion overlap each other in an axial direction of the electrophotographic photosensitive drum, and

a second gear portion provided in juxtaposed relationship with said gear portion and disposed between said gear portion and said coupling portion in the axial direction, wherein said second gear portion transmits a driving force to a transfer roller provided in the main body of the apparatus,

wherein when the twisted hole is rotated with said protrusion fitted in the twisted hole when the process cartridge is mounted to the main body of the apparatus, the rotational force of the twisted hole is received by said protrusion for rotating the electrophotographic photosensitive drum from the rotational force from the main body of the apparatus, and

wherein said coupling portion, said second gear portion, said gear portion, said shaft, and said twisted protrusion provided on an end surface of said shaft are formed integrally.

14. (Cancelled)

15. (Cancelled)

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16. (Currently Amended) A driving-force transmitting part according to Claim 14;

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wherein a through-hole is formed through said coupling portion, said gear portion, said shaft portion overlapping said gear portion, and said protrusion,

wherein a grounding pin is provided in the through-hole, and

wherein said grounding pin is provided on the inner end surface of said driving-force transmitting part, and is in contact with a grounding plate which is in contact with the inner surface of the drum cylinder, whereby when the process cartridge is mounted to the main body of the apparatus, said grounding pin comes into contact with a main body grounding contact provided in the twisted hole, and the electrophotographic photosensitive drum is electrically grounded to the main body of the apparatus.

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17. (Currently Amended) A driving-force transmitting part according to Claim 13 or 16, 13, 14, or 16, wherein a portion of said shaft is surrounded by said gear portion.

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18. (Currently Amended) A driving-force transmitting part according to Claim 15 or 16 13, 14, or 16, wherein the cross-section of the twisted hole is a substantially equilateral triangle, and the cross-section of said protrusion is a substantially equilateral triangle.

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19. (Currently Amended) An electrophotographic image forming apparatus to which a process cartridge is detachably mountable for forming an image on a recording medium, comprising:

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(a) a twisted hole whose cross-section has a plurality of corners; and
(b) a mounting portion for detachably mounting the process cartridge, the process cartridge having:

an electrophotographic photosensitive drum having a drum cylinder;

a developing roller for developing an electrostatic latent image formed on the electrophotographic photosensitive drum;

a driving-force transmitting part provided on one lengthwise end of the electrophotographic photosensitive drum, and having:

a coupling portion fitted and fixed to one end of the drum cylinder of the electrophotographic photosensitive drum,

a twisted protrusion to be fitted in said twisted hole, wherein a cross-section of the twisted protrusion has a plurality of corners,

a shaft ~~portion~~ supported by a bearing portion,

a gear portion for transmitting a driving force to the developing roller, wherein the shaft comprises a shaft portion where said shaft and the gear portion overlap each other in an axial direction of said electrophotographic photosensitive drum, and

a second gear portion provided in juxtaposed relationship with said gear portion and disposed between the gear portion and the coupling portion in the axial

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direction, and said second gear portion transmits a driving force to a transfer roller provided in the main body of the apparatus,

wherein when said twisted hole is rotated with said protrusion fitted in said twisted hole when the process cartridge is mounted to the main body of said apparatus, the rotation of said twisted hole is transmitted to the electrophotographic photosensitive drum through the protrusion, and

wherein the coupling portion, the second gear portion, the gear portion, the shaft, and the twisted protrusion provided on an end surface of the shaft are formed integrally.

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20. (Currently Amended) An electrophotographic photosensitive drum for use in a process cartridge detachably mountable to a main body of an electrophotographic image forming apparatus for forming an image on a recording medium, the main body having a motor, an apparatus main body gear for transmitting a driving force of the motor, and a non-circular twisted hole rotated with the apparatus main body gear, a cross-section of the twisted hole having a plurality of corners, said electrophotographic photosensitive drum comprising:

a. a cylinder having a photosensitive layer on the peripheral surface thereof; and
b. a driving-force transmitting part mounted on one end of said cylinder, said driving-force transmitting part comprising:

a coupling portion fitted and fixed to one end of said cylinder of said electrophotographic photosensitive drum,

a spur gear for transmitting a driving force received from the main body of the apparatus to a transfer roller provided in the main body of the apparatus when the process cartridge is mounted to the main body of the apparatus,

a helical gear provided in juxtaposed relationship with said spur gear and disposed between said spur gear and said coupling portion in an axial direction of said electrophotographic photosensitive drum for transmitting the driving force received from

the main body of the apparatus to a developing roller provided in the process cartridge
when the process cartridge is mounted to the main body of the apparatus,

a shaft portion provided in juxtaposed relationship with said helical gear, and
rotatably supported by a bearing portion when said photosensitive drum is mounted in the
process cartridge, and

a non-circular twisted protrusion fitted into the twisted hole provided in the
main body of the apparatus, to receive the transmission of the driving force from the main
body of the apparatus, the cross-section of which has a plurality of corners,

wherein when said photosensitive drum is mounted in the process cartridge, said
shaft portion has an area overlapping an area in which said helical gear is provided, and

wherein the driving force received from the main body of the apparatus through the
twisted hole and said protrusion is transmitted to said cylinder through said helical gear and
said spur gear, and is transmitted to the developing roller through said helical gear, and is
transmitted to the transfer roller through said spur gear, and

wherein said coupling portion, said helical gear, said spur gear, said shaft portion,
and said twisted protrusion provided on an end surface of said shaft portion are formed
integrally.

21. (Previously Presented) An electrophotographic photosensitive drum according
to Claim 20, wherein on the end surface of said helical gear, a circular recess is provided
on a line coaxial with an axis, and the bearing portion slides with the outer peripheral
surface of said shaft portion and the inner peripheral surface of said recess which is
continuous from said outer peripheral surface, and rotatably supports said shaft portion and
said recess.

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22. (Previously Presented) An electrophotographic photosensitive drum according to Claim 21, further comprising a grounding member for grounding said photosensitive drum to the main body of the apparatus when the process cartridge is mounted to the main body of the apparatus, said grounding member being provided at the center of said driving-force transmitting part in an axial direction thereof.

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23. (Cancelled)

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24. (Currently Amended) An electrophotographic photosensitive drum according to Claim ~~20, 21 or 22~~ 20, 21, or 22 or, wherein the tooth width of said spur gear is narrower than the tooth width of said helical gear, and the number of teeth of said spur gear is smaller than the number of teeth of said helical gear.

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25. (Currently Amended) An electrophotographic photosensitive drum according to Claim ~~20, 21 or 22~~ 20, 21, or 22, wherein the shape of said protrusion is a twisted substantially equilateral triangular prism, wherein the corners of said substantially equilateral triangular prism are chamfered, and said protrusion is fitted into the twisted hole whose cross-section is a substantially equilateral triangle.

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26. (Currently Amended) A process cartridge detachably mountable to a main body of an electrophotographic image forming apparatus for forming an image on a recording medium, the electrophotographic image forming apparatus having a motor, a main body gear for transmitting a driving force of the motor, and a non-circular twisted hole provided in a central portion of the main body gear and rotated with the main body

gear, wherein a cross-section of the twisted hole has a plurality of corners, said process cartridge comprising:

(a) an electrophotographic photosensitive drum having:

- a. a cylinder having a photosensitive layer on a peripheral surface thereof; and
- b. a driving-force transmitting part mounted on one end of said cylinder and

having:

a coupling portion fitted and fixed to one end of said cylinder of said electrophotographic photosensitive drum,

a spur gear for transmitting a driving force received from the main body of the apparatus to a transfer roller provided in the main body of the apparatus when said process cartridge is mounted to the main body of the apparatus,

a helical gear provided in juxtaposed relationship with said spur gear and disposed between said spur gear and said coupling portion in an axial direction of said electrophotographic photosensitive drum for transmitting the driving force received from the main body of the apparatus to a developing roller provided in said process cartridge when said process cartridge is mounted to the main body of the apparatus,

a shaft portion provided in juxtaposed relationship with said helical gear, and rotatably supported by a bearing portion when said photosensitive drum is mounted in said process cartridge, and

a non-circular twisted protrusion to be fitted into the twisted hole when said process cartridge is mounted to the main body of the apparatus to receive the transmission of the driving force from the main body of the apparatus and whose cross-section has a plurality of corners,

wherein when said photosensitive drum is mounted in said process cartridge in the axial direction thereof, said shaft portion has an area overlapping an area in which said helical gear is provided, and transmits the driving force received from the main body of the apparatus to said cylinder through said helical gear and said spur gear, and transmits the

driving force to said developing roller through said helical gear, and transmits the driving force to the transfer roller through said spur gear, and

wherein said coupling portion, said helical gear, said spur gear, said shaft portion, and said twisted protrusion provided on an end surface of said shaft portion are formed integrally; and

(b) said developing roller for developing an electrostatic latent image formed on said electrophotographic photosensitive drum.

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27 (Previously Presented) A process cartridge according to Claim *19* ~~26~~, wherein on the end surface of said helical gear, a circular recess is provided on a line coaxial with an axis, and the bearing portion slides with the outer peripheral surface of said shaft portion and the inner peripheral surface of said recess which is continuous from said outer peripheral surface, and rotatably supports said shaft portion and said recess.

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28 (Previously Presented) A process cartridge according to Claim *19* ~~26~~ or *20* ~~27~~, further comprising a grounding member for grounding said photosensitive drum to the main body of the apparatus when said process cartridge is mounted to the main body of the apparatus, said grounding member being provided at the center of said driving-force transmitting part in an axial direction thereof.

29 (Cancelled)

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30 (Previously Presented) A process cartridge according to Claim *19* ~~26~~ or *20* ~~27~~, wherein the tooth width of said spur gear is narrower than the tooth width of said helical gear, and the number of teeth of said spur gear is smaller than the number of teeth of said helical gear.

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31. (Previously Presented) A process cartridge according to Claim 26 or 27,

wherein the shape of said protrusion is a twisted substantially equilateral triangular prism, wherein the corners of said substantially equilateral triangular prism are chamfered, and wherein said protrusion is fitted in the twisted hole whose cross-section is a substantially equilateral triangle.

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32. (Currently Amended) A driving-force transmitting part for use in a process cartridge detachably mountable to a main body of an electrophotographic image forming apparatus for forming an image on a recording medium, the electrophotographic image forming apparatus having a motor, a main body gear for transmitting a driving force of the motor, and a non-circular twisted hole formed in the central portion of the main body gear and rotated with the main body gear, wherein a cross-section of the twisted hole has a plurality of corners, said driving-force transmitting part comprising:

a fitted portion to be fitted to a cylinder of an electrophotographic photosensitive drum in order to be mounted on one end of the cylinder;

a spur gear for transmitting a driving force received from the main body of the apparatus to a transfer roller provided in the main body of the apparatus when the process cartridge is mounted to the main body of the apparatus;

a helical gear provided in juxtaposed relationship with said spur gear and disposed between said spur gear and said fitted portion in an axial direction of said electrophotographic photosensitive drum for transmitting the driving force received from the main body of the apparatus to a developing roller provided in the process cartridge when the process cartridge is mounted to the main body of the apparatus;

a shaft portion provided in juxtaposed relationship with said helical gear, and rotatably supported by a bearing portion when the photosensitive drum is mounted in the process cartridge; and

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a non-circular twisted protrusion to be fitted into the twisted hole to receive the transmission of the driving force from the main body of the apparatus wherein the cross-section of said protrusion has a plurality of corners,

wherein when the photosensitive drum is mounted in the process cartridge in an axial direction thereof, said shaft portion has an area overlapping an area in which said helical gear is provided, and transmits the driving force received from the main body of the apparatus through the twisted hole and said protrusion to the cylinder through said helical gear and said spur gear, and transmits the driving force to the developing roller through said helical gear, and transmits the driving force to the transfer roller through said spur gear, and

wherein said fitted portion, said helical gear, said spur gear, said shaft portion, and said twisted protrusion provided on an end surface of said shaft portion are formed integrally.

24 25 33. (Previously Presented) A driving-force transmitting part according to Claim 32, wherein on the end surface of said helical gear, a circular recess is provided on a line coaxial with an axis, and the bearing portion slides with the outer peripheral surface of said shaft portion and the inner peripheral surface of said recess which is continuous from said outer peripheral surface, and rotatably supports said shaft portion and said recess.

25 24 34. (Previously Presented) A driving-force transmitting part according to Claim 32 or 33, further comprising a grounding member for grounding the photosensitive drum to the main body of the apparatus when the process cartridge is mounted to the main body of the apparatus, said grounding member being provided at the center of said driving-force transmitting part in an axial direction thereof.

35. (Cancelled)

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36. (Previously Presented) A driving-force transmitting part according to Claim 32 or 38, wherein the tooth width of said spur gear is narrower than the tooth width of said helical gear, and the number of teeth of said spur gear is smaller than the number of teeth of said helical gear.

25 28 24
37. (Previously Presented) A driving-force transmitting part according to Claim 32 or 38, wherein the shape of said protrusion is a twisted substantially equilateral triangular prism, the corners of said substantially equilateral triangular prism are chamfered, and said protrusion is fitted in the twisted hole whose cross-section is a substantially equilateral triangle.

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38. (Currently Amended) An electrophotographic image forming apparatus to which a process cartridge is detachably mountable for forming an image on a recording medium, comprising:

- (a) a motor;
- (b) a main body gear in a main body of said apparatus for transmitting a driving force of said motor;
- (c) a non-circular twisted hole provided in a central portion of said main body gear and rotated with said main body gear, a cross-section of said twisted hole having a plurality of corners;
- (d) a transfer roller for transferring a developed image formed on an electrophotographic photosensitive drum to the recording medium; and
- (e) a mounting portion for detachably mounting the process cartridge, the process cartridge having:
 - (i) the electrophotographic photosensitive drum including:
 - a. a cylinder having a photosensitive layer on a peripheral surface thereof;

b. a driving-force transmitting part mounted on one end of the cylinder, and
the driving-force transmitting part having:

a coupling portion fitted and fixed to one end of the cylinder of the
electrophotographic photosensitive drum,

a spur gear for transmitting a driving force received from the main
body of said apparatus to said transfer roller when the process cartridge is mounted to the
main body of said apparatus,

a helical gear provided in juxtaposed relationship with the spur gear
and disposed between the spur gear and the coupling portion in an axial direction of the
electrophotographic photosensitive drum for transmitting the driving force received from
the main body of said apparatus to a developing roller provided in the process cartridge
when the process cartridge is mounted to the main body of said apparatus,

a shaft portion provided in juxtaposed relationship with the helical
gear, and rotatably supported by a bearing portion when the photosensitive drum is
mounted in the process cartridge, and

a non-circular twisted protrusion fitted into said twisted hole to
receive the transmission of the driving force from the main body of said apparatus when
the process cartridge is mounted to the main body of said apparatus, and whose
cross-section has a plurality of corners,

wherein when the photosensitive drum is mounted in the process cartridge
in the axial direction thereof, the shaft portion has an area overlapping an area in which the
helical gear is provided, and transmits the driving force received from the main body of
said apparatus through said twisted hole and the protrusion to said cylinder through the
helical gear and the spur gear, and transmits the driving force to said developing roller
through the helical gear, and transmits the driving force to said transfer roller through the
spur gear; and

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wherein the coupling portion, the helical gear, the spur gear, the shaft portion, and the twisted protrusion provided on an end surface of the shaft portion are formed integrally; and

(ii) said developing roller for developing an electrostatic latent image formed on the photosensitive drum.
